IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of
WEST et al.
Serial No. 10/535,493
Filed: May 18, 2005
For: ASSEMBLY OF SEALED COMPONENTS

Confirmation No.: 3929
Atty. Ref.: 540-563
Group: 1791
Examiner: J. Goff II

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APPEAL BRIEF

On Appeal From Group Art Unit 1791

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August 12, 2008

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APPEAL BRIEF

Sir:

I. REAL PARTY IN INTEREST

The real party in interest in the above-identified appeal is Airbus UK Limited by virtue of an assignment of rights from the inventors to BAE Systems plc recorded May 18, 2005 at Reel 17009, Frame 486 and an assignment of rights from BAE Systems plc to Airbus UK Limited recorded April 20, 2006 at Reel 17791, Frame 981.

II. RELATED APPEALS AND INTERFERENCES

There are believed to be no related appeals, interferences or judicial proceedings with respect to the present application.

III. STATUS OF CLAIMS

Claims 1-23 stand rejected in the Final Rejection. Claims 24 and 25 have been cancelled without prejudice and Claims 22 and 23 have been rejected as anticipated under 35 USC §102(b) by John (U.S. Patent 3,022,870).

Claims 1-23 stand rejected over John in view of any one of Cheron (FR 2498671), Ishiara (JP 11072999) or Hansen (U.S. Patent 4,697,970) in combination either by itself or with Smith (U.S. Patent 3,659,896) or Akmal ("Handbook of Adhesive Terminology"). Claims 1-23 also stand rejected under 35 USC §103 as unpatentable over the admitted prior art (specification, page 1) in view of John, by itself or including Lester (U.S. Patent 3,904,038), Smith or Akmal. Claims 22 and 23 also stand provisionally rejected over the unpatented copending Application No. 11/020,873. All of the above rejections of claims 1-23 are appealed.

IV. STATUS OF AMENDMENTS

A Rule 116 Request for Reconsideration was filed on June 19, 2008 requesting reconsideration of the Final Rejection in view of the accompanying Declaration of Dr. Steven Harris executed June 17, 2008. The Advisory Action mailed July 2, 2008 (Paper No. 20080626) confirmed entry of the Declaration to the record in this Appeal is very much appreciated.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellants' specification and figures provide an explanation of the claimed invention set out in independent claims 1 and 22, with each claimed structure and method step addressed as to its location in the specification and in the figures.

"1. A method of assembling components [samples 1 and 2 as shown in Figures 3 and 4 and discussed on page 5, lines 16-19 and elsewhere in the specification] together in sealed relationship, the components have respective mating surfaces, the method including the steps of:

applying to at least one mating surface a layer of polysulphide sealant [skim 3 & 4 as shown in Figures 3 & 4 and discussed on page 5, lines 20-22 and elsewhere in the specification] and allowing the sealant to cure [as discussed on page 6, lines 18-20 and elsewhere in the specification];

after allowing said sealant to cure, bringing together the mating surfaces [as shown in Figures 3 & 4 and discussed on page 6, lines 21-22 and elsewhere in the specification]; and

applying a pre-determined pressure therebetween for a pre-determined period whereby to bring about a sealed joint between the two mating surfaces [as shown in Figure 4 and discussed on page 6, lines 23-24 and elsewhere in the specification]."

"22. An assembly of two components [samples 1 and 2 as shown in Figures 3 and 4 and discussed on page 5, lines 16-19 and elsewhere in the specification] for forming a fluid-tight seal together, each component [1 & 2] having a mating surface for sealing to a mating surface of the other component [surfaces shown in Figures 3 and 4 and discussed on page 5, lines 16-19 and elsewhere in the specification], said assembly comprising at least one said mating surface having a layer of polysulphide sealant cured thereon prior to assembly [as shown in Figures 3 & 4 and discussed on page 6, lines 21-22 and elsewhere in the specification]."

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 22 and 23 stand rejected under 35 USC §102(b) as being anticipated by John (U.S. Patent 3,022,870).

Claims 1-10, 14(1-10) and 20-23 stand rejected under 35 USC §103(a) as being unpatentable over John in view of one of Cheron (FR 2498671), Ishiara (JP 11072999) or Hanson (U.S. Patent 4,697,970).

Claims 11-13, 14(11-13) and 15 stand rejected under 35 USC §103(a) as being unpatentable over John in view of one of Cheron, Ishiara or Hanson further in view of Smith (U.S. Patent 3,659,896).

Claims 16-19 stand rejected under 35 USC §103 a being unpatentable over John in view of one of Cheron, Ishiara or Hanson and further in view of Akmal ("Handbook of Adhesive Technology").

Claims 1, 3-10, 14(1 and 3-10) and 20-23 stand rejected under 35 USC §103(a) as being unpatentable over the admitted prior art (specification page 1) in view of John.

Claims 2 and 14(2) stand rejected under 35 USC §103(a) as unpatentable over the admitted prior art and John further in view of Lester (U.S. Patent 3,904,038).

Claims 11-13, 14(11-13) and 15 stand rejected under 35 USC §103(a) as unpatentable over the admitted prior art and John and further in view of Smith.

Claims 16-19 stand rejected under 35 USC §103(a) as unpatentable over the admitted prior art and John and further in view of Akmal.

Claims 22 and 23 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 22 of copending Application No. 11/020,873.

VII. ARGUMENT

Appellants' arguments include the fact that the burden is on the Examiner to first and foremost properly construe the language of the claims to determine what structure and/or method steps are covered by that claim. After proper construction of the claim language, the burden is also on the Examiner to demonstrate where a single reference (in the case of anticipation) or a plurality of references (in the case of an obviousness rejection) teaches each of the structures and/or method steps recited in independent claims 1 and 22.

The Court of Appeals for the Federal Circuit has noted in the case of *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 USPQ 481, 485 (Fed. Cir. 1984) that "[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim."

Furthermore, the Court of Appeals for the Federal Circuit has stated in the case of *In re Rouffet*, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998)

"to prevent the use of hindsight based on the invention to defeat patentability of the invention, this court **requires** the examiner to show a **motivation** to

combine the references that create the case of obviousness. In other words, the Examiner **must show reasons** that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." (Emphasis added).

In its recent decision, the U.S. Supreme Court in *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (April 2007), held that "[t]o facilitate review [of the reasons for combining prior art], this analysis should be made explicit." *Id.* at 1396.

The Supreme Court in its *KSR* decision went on to say that it followed the Court of Appeals for the Federal Circuit's advice that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness" (emphasis added, the Supreme Court quoting from the Court of Appeals for the Federal Circuit in *In re Kahn*, 78 USPQ2d 1329 (Fed. Cir. 2006)).

A. The Examiner clearly fails to properly construe the claim language "after allowing the [polysulphide] sealant to cure" in claim 1 and such sealant "cured thereon prior to assembly" in claim 22

The Examiner ignores the plain meaning of the English language, ignores the definition in the specification and ignores the understanding that those of ordinary

skill in the art would have of the claim terms, as evidenced by Dr. Harris testimony in the Rule 132 Declaration signed June 17, 2008 and admitted into the record by the Advisory Action of July 2, 2008 (Paper No. 20080626)(hereinafter "the Declaration").

The claim phrases "after allowing the sealant to cure" and "cured thereon prior to assembly" both require curing of the polysulphide sealant **prior** to any assembly of the components, i.e., pre-assembly curing of the sealant. In the plain meaning of the English language, where material is less than fully "cured," such materials are considered to be "partially cured." Appellants' claims have no mention of the modifier "partially" in conjunction with the word "cured" and therefore anyone reading the claim language will clearly understand that the references are to completely cured materials.

Moreover, should there be any indefiniteness as to what is meant by the claim phrases, "after allowing the sealant to cure" and "cured thereon prior to assembly," current legal precedent requires the Examiner to resort to the specification and to construe the indefinite claim term in the manner disclosed in the specification. While Appellant believes that "cured" is definite, should the Examiner believe otherwise, the specification clearly states on page 6, lines 18-20, that the polysulphide sealant utilized was placed in temperature and humidity controlled conditions for "14 days to fully cure" and that it was this fully cured sealant that was subsequently used in the assembly, i.e., the pre-assembly curing is required. Again,

there is no disclosure in Appellants' specification of "partial curing" so that the only direction to those of ordinary skill in the art reading the specification is that a substantial period of time is necessary in order for the sealant to cure as required by the claims.

Notwithstanding the plain meaning of the claim language as well as the specification definition of the term, Appellants have also provided the Declaration of an expert in the field of chemical sealants, i.e., Dr. Steven Harris, who for the last 15 years has been involved in "adhesive bonding technology," "paints and coatings," and "sealants." His undergraduate degree with honors in Applied Chemistry and his PhD in "Surface Science" all establish Dr. Harris as an expert in the field relating to polysulphide sealants, their application and use.

As an expert, it is well-settled law that Dr. Harris' testimony is to be considered factual evidence of record, transferring the burden of proof to the party whose opinion disputes the expert testimony. In paragraph 6 of his Declaration, Dr. Harris defines that "cured thereon" is a reference to a polysulphide sealant having the properties of a cured sealant, i.e., being "tack free," non-adherent "to other materials," "a Shore A hardness of approximately 39" and "good levels of environmental resistance."

In paragraph 19, Dr. Harris confirms that in the time period specified in Appellants' specification, i.e., 14 days, the sealant is "approximately 99% cured and

therefore this is the definition to the word 'cure' as used in the specification and the claims."

Thus, even though in the Advisory Action the Examiner states that he "**considers** sealant 'cured' to have a meaning of 'cross-linking at least some of the polymer chains in the sealant," (emphasis added) the Examiner's "consideration" is at odds with the conventional dictionary definitio of the word "cured" (as opposed to "partially cured"), the specification definition of "cured" and Dr. Harris' testimony as to what those of ordinary skill in the art would understand is meant by the word "cured."

Because the Examiner provides no evidence in support of his definition (other than his "consideration") and because his definition is at odds with the claim, the specification and Dr. Harris' testimony, the Examiner's erroneous claim construction is reversible error in this case based on the evidence of record thus far.

B. The Examiner errs in concluding that John anticipates claims 22 and 23

In the citation to John purportedly discloses Appellants' claimed pre-assembly curing of polysulphide sealant. The pertinent portion of the statement reads:

> "The above-described mixture cures in about 2 hours to a non-spreadable state, and the entire batch is therefore spread out

between the polyethylene film slipsheets within somewhat less than that time." Col. 2, lines 63-66

The Examiner takes out of context the portion of the statement that "the above-described mixture cures in about 2 hours" as the excluded portion of the statement clarifies that the statement meant only partially curing "to a non-spreadable state" and does not mean that the sealant is cured after only 2 hours.

There is no teaching in the John reference of applying sealant to at least one mating surface and then allowing the sealant to cure before bringing together mating surfaces. Instead, John teaches allowing a polysulphide sealant and other elements to partially cure for a short period of time at room temperature for subsequent cutting "into sheets or slit into narrow strips for subsequent packaging and use." He specifically teaches that the polysulphide mixture cures "in about 2 hours to a non-spreadable state" so the spreading and cutting must occur in less than 2 hours time.

There is certainly no disclosure in John that the polysulphide sealant is applied to a mating surface and then permitted to completely cure and then bringing the mating surfaces together as required by independent claims 1 and 22.

Moreover, the error of the Examiner's various positions and statements from the Final Rejection is clearly set out in Dr. Harris' Declaration at paragraphs 7 and 8. Many of the reasons why the Examiner statements are erroneous is set out explicitly in paragraphs 17-27 and are summarized in paragraph 28. Dr.

Harris' testimony is that "the John reference does not teach that the layer of polysulphide sealant is cured 'prior to' assembling the mating surfaces."

Thus, the Examiner's contention that the John reference discloses the subject matter of independent claim 22 (or claim 23 dependent thereon) is simply incorrect and is unsupported by any evidence of record and any further rejection of claims 22 and 23 under 35 USC §102(b) is respectfully traversed.

C. The Examiner's obviousness rejections of claims 1 and 22 and claims dependent thereon all involve the John reference and therefore are unsupported

Independent claims 1 and 22, as well as claims dependent thereon, are rejected under 35 USC §103 as being unpatentable over the John reference either as a primary reference or a secondary reference. The above discussions with respect to the Examiner's error in failing to properly construe independent claims 1 and 22 (in section A) as well as the Examiner's error in failing to demonstrate how John discloses the subject matter of Appellants' independent claims 1 and 22 (in section B) are herein incorporated by reference.

Paragraphs 9-16 of Dr. Harris' Declaration confirm that those of ordinary skill in the art, in view of Appellants' specification, will be well aware of the various benefits of the claimed invention. For example, paragraph 10 confirms that pre-assembly curing of the sealant will result in a "layer of sealant that is thicker and will exist across the faying or mating surfaces." Furthermore, as

discussed in paragraph 11, due to curing of the sealant prior to assembly, "the sealant layer will not be in tension but will normally be in compression."

These benefits are contrasted with the prior art method of "post-assembly curing" of sealant and its problems in paragraphs 13 and 14, i.e., sealant being squeezed out from between the "faying or mating" surfaces with the cured sealant being under slight tension "due to the inherent shrinkage occurring during the curing process." These prior art problems would be inherent in the disclosure in the John reference, but would not occur in the present invention because the sealant is "fully cured, it does not squeeze or flow under assembly pressure." (Paragraph 16 of the Harris Declaration).

Notwithstanding the failure of the John reference to disclose pre-assembly curing of sealant, there is no allegation that any of the cited secondary references supply this missing disclosure. Accordingly, even if John were combined with the other references in the various "obviousness" rejections, the combination would not render obvious the subject matter of claims 1 and 22 or claims dependent thereon and therefore any further rejection of the pending claims under 35 USC §103 is respectfully traversed.

D. The Examiner errs in concluding that the claimed product "appears to be the same or similar to that of the prior art, although produced by a different process"

The Examiner concludes, in the paragraph bridging pages 2 and 3 of the Final Rejection, that where a claimed product "appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to the applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior product."

Such evidence establishing unobvious differences is discussed in Dr. Harris' Declaration, paragraph 29, i.e., there are "numerous differences" between a resultant assembly when accomplished in the manner of the John patent, i.e., **post-assembly curing**, and the resultant assembly when accomplished in the manner of independent claims 1 and 22, i.e., **pre-assembly curing**.

Dr. Harris identifies at least four significant differences, i.e., (a) thicker sealant layer; (b) cured layer extends more uniformly; (c) the existence of "a sealant area in the area of the fasteners;" and (d) the sealant layer "will normally be in compression." Each of the above four are differences between the assembled product using **pre-assembly curing** of the sealant in accordance with the present invention as opposed to the assembled product using **post-assembly curing** as in John and the other prior art (see paragraphs 30 and 31 of the Harris Declaration).

As a result of the above, the Examiner's statement in the sentence bridging pages 2 and 3 of the Final Rejection is not only proven to be incorrect by evidence

of record, Appellants have come forward with of record evidence "establishing an unobvious difference between the claimed product and the prior art product."

E. Rejection of claims 22 and 23 as anticipated by John

The above discussion of Appellants' claim language and the John reference contained in subsections A-D are herein incorporated by reference. As noted above, the John reference clearly fails to teach pre-assembly "curing" of sealants and therefore the positively recited step in claim 22 of "at least one said mating surface having a layer of polysulphide sealant cured thereon prior to assembly" is clearly not met.

Because John does not disclose each and every claimed element and method step "arranged as in the claim," he cannot anticipate claim 22 or claim 23 dependent thereon and therefore any further rejection thereunder is respectfully traversed.

F. Rejection of claims 1-10, 14 and 20-23 as unpatentable over John in view of Cheron, Ishiara or Hanson

The above discussion of Appellants' claim language and the John reference contained in subsections A-D are herein incorporated by reference. As noted above, the John reference fails to disclose the step of bringing together mating surfaces "after allowing said sealant to cure" (claim 1) or "having a layer of polysulphide sealant cured thereon prior to assembly" as in claim 22. Because the

Examiner does not specifically point out where any one of the four cited references contains this disclosure of the pre-assembly curing feature of Appellants' independent claims, there is in fact no disclosure of a specifically claimed method step.

The Examiner is reminded that the Court of Appeals for the Federal Circuit has held that "the PTO has the burden under Section 103 to establish a *prima facie* case of obviousness." *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). "It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

Quite clearly, the Examiner has failed to meet his burden of establishing a *prima facie* case of obviousness by disclosing how and where any of the primary or secondary references teaches Appellants' claimed step of pre-assembly curing of sealant. Accordingly, there can be no *prima facie* case of obviousness of the independent claims 1 and 22 over the John reference in view of Cheron, Ishiara or Hanson and any further rejection of the independent claims or claims dependent thereon over the John/Cheron/Ishiara/Hanson combination, no matter how combined, still fails to meet the Examiner's burden.

Moreover, the Examiner fails to provide the required explicit "analysis" as set out in the above-discussed *KSR* opinion of the U.S. Supreme Court. The Court has observed that a reviewing authority, whether the Court of Appeals for the

Federal Circuit, Board of Patent Appeals and Interferences or other reviewing authority, can ascertain the propriety of the picking and choosing of elements from separate references and then combining them in accordance with Appellants' claims, if the Examiner fails to provide the **explicit** "analysis" for such rationale. Here the Examiner has simply failed to meet his burden of providing some reason or motivation for combining portions of the John reference with the other secondary references, even if John did teach pre-assembly curing of sealant (which, as noted above, he clearly does not).

Finally, even if the Examiner had met his burden of setting out a *prima facie* case of obviousness, that case is rebutted if the cited prior art actually teaches or leads one of ordinary skill in the art away from the claimed invention. The Federal Circuit has also opined that it is "error to find obviousness where references 'diverge from and teach away from the invention at hand'." *In re Fine* at 1599.

As noted in Dr. Harris' discussion of the John reference, at paragraph 27, the John reference at column 3, lines 64-67 teaches away from a fully cured sealant because "an excessive cure, on the other hand, reduces the adhesive properties of the film to a degree which makes it difficult to apply in commercial sealing operations, e.g., in the assembling of an aircraft." As noted by Dr. Harris, this passage "clearly teaches away from the current invention."

Thus, the language of the primary reference, John, would lead one of ordinary skill in the art away from Appellant's claimed combination of method steps in which the sealant is cured prior to assembling the product. As stated in *In re Fine* above, the teaching away of a prior art reference is a clear rebuttal to a *prima facie* case of obviousness, assuming for the purpose of argument that such a case has been made out (which it has not, as noted above).

Accordingly, even if there were a *prima facie* case of obviousness, it is rebutted by Appellant's pointing out that the John reference teaches away from the combination set out in independent claims 1 and 22.

As a result, any further rejection of independent claims 1 and 22 or claims dependent thereon over the John/Cheron/Ishiara/Hanson combinations is respectfully traversed because (1) there is no disclosure of all claimed steps; (2) there is no explicit "analysis" of the rationale for combining portions of the references; and (3) the primary reference to John would lead one of ordinary skill in the art away from the claimed combination of method steps.

G. Rejection of claims 11-15 as unpatentable over John and Cheron, Ishiara or Hanson, further in view of Smith

Because the rejection of claims 11-15 is based upon the combination of John and one of Cheron, Ishiara or Hanson, the above comments in subsection F

are herein incorporated by reference inasmuch as claims 11-15 all depend from independent claim 1.

The Examiner makes no allegation that the Smith reference contains any disclosure of the missing step of pre-assembly curing of sealant. Accordingly, even if combined with Smith, there can be no disclosure of the subject matter of independent claim 1 or claims 11-15 dependent thereon.

Moreover, the Examiner does not provide any analysis of why one would combine Smith with the assemblage of John and one of Cheron, Ishiara and Hanson. Finally, the Examiner does not allege that Smith somehow negates the negative teaching of the John reference as noted above.

Accordingly, the Examiner fails to support his rejection of claims 11-15 in that they depend from claim 1, which as noted above, is clearly patentable over the cited prior art and any further rejection thereunder is respectfully traversed.

H. Rejection of claims 16-19 as unpatentable over John and Cheron, Ishiara or Hanson, further in view of Akmal

Because the rejection of claims 16-19 is based upon the combination of John and one of Cheron, Ishiara or Hanson, the above comments in subsection F are herein incorporated by reference inasmuch as claims 16-19 all depend from independent claim 1.

The Examiner makes no allegation that the Akmal reference contains any disclosure of the missing step of pre-assembly curing of sealant. Accordingly,

even if combined with Akmal, there can be no disclosure of the subject matter of independent claim 1 or claims 11-15 dependent thereon.

Moreover, the Examiner does not provide any analysis of why one would combine Akmal with the assemblage of John and one of Cheron, Ishiara and Hanson. Finally, the Examiner does not allege that Akmal somehow negates the negative teaching of the John reference as noted above.

Accordingly, the Examiner fails to support his rejection of claims 16-19 in that they depend from claim 1, which as noted above, is clearly patentable over the cited prior art and any further rejection thereunder is respectfully traversed.

I. Rejection of claims 1, 3-10, 14 and 20-23 as unpatentable over admitted prior art in view of John

Here the Examiner uses Appellants' admission as to the prior art post-assembly curing process, which is well known in the art, as the primary reference and then cites the John patent as a secondary reference. The above discussion of the John reference in section F is herein incorporated by reference.

Appellants' specification is clearly acknowledged prior art and the Board's attention is directed to the teaching on page 1 of the specification, lines 15-19, which details the **post-assembly** curing of sealant ("a well known method of sealing the joints between adjacent structural members is to apply curable liquid polymers to a mating surface of one of the components by brush or roller, and then

to bring the components together **while the polymer is still soft** to form a fluid tight seal along the mating surfaces of the joined components" (emphasis added).

Thus, the admitted prior art in Appellants' specification at page 1 clearly teaches away from Appellants' claimed combination of method steps involving pre-assembly curing of sealant. The specification details that which is done in the prior art, i.e., assemble the components first and then cure the sealant, i.e., post-assembly curing. Appellants' invention is pre-assembly curing, i.e., cure the sealant and then assemble the components and the benefits of such pre-assembly curing are detailed in Dr. Harris' Declaration, as noted above. There is no suggestion by the Examiner that these benefits are somehow obvious, other than with 20/20 hindsight.

Thus, with respect to the rejection of independent claims 1 and 22 or claims dependent thereon over the "admitted prior art" in view of John, both the admitted prior art and the John reference fail to disclose Appellants' claimed method step of pre-assembly curing of sealant. Again, the Examiner fails to provide any explicit "analysis" as to his rationale for combining portions of the methods disclosed in the admitted prior art and in the John reference. Finally, the Examiner appears to ignore the fact that both the admitted prior art and the John reference teach away from Appellants' claimed method steps, i.e., pre-assembly curing of sealant materials.

As a result of the above, there is clearly no basis for rejection of independent claims 1 and 22 or claims dependent thereon over the admitted prior art in view of John and any further rejection thereunder is respectfully traversed.

J. Rejection of claims 2 and 14 as unpatentable over admitted prior art and John, further in view of Lester

Claims 2 and 14 depend from independent claim 1 and therefore the above discussion of the admitted prior art and the John reference set out in subsection I is herein incorporated by reference. It is noted that the Examiner does not allege that the Lester reference teaches the missing method step from the admitted prior art and the John reference, i.e., pre-assembly curing of sealant materials.

Additionally, the Examiner fails to set out any explicit "analysis" of why he would pick and choose elements or method steps from the admitted prior art and the John and Lester references and then combine them in the manner of Appellants' claims. Moreover, the Examiner does not appear to recognize that both the admitted prior art and the John reference teach away from the claimed combination of method steps set out in independent claims 1 and 22 and additionally does not indicate how the Lester reference overcomes this negative teaching.

As a result of the above, claim 1 and claims 2 and 14 dependent thereon are clearly non-obvious over the admitted prior art, John and Lester combination and any further rejection thereunder is respectfully traversed.

K. Rejection of claims 11-15 as unpatentable over admitted prior art and John, further in view of Smith

Claims 11-15 depend from independent claim 1 and therefore the above discussion of the admitted prior art and the John reference set out in subsection I is herein incorporated by reference. It is noted that the Examiner does not allege that the Smith reference teaches the missing method step from the admitted prior art and the John reference, i.e., pre-assembly curing of sealant materials.

Additionally, the Examiner fails to set out any explicit "analysis" of why he would pick and choose elements or method steps from the admitted prior art and the John and Smith references and then combine them in the manner of Appellants' claims. Moreover, the Examiner does not appear to recognize that both the admitted prior art and the John reference teach away from the claimed combination of method steps set out in independent claims 1 and 22 and additionally does not indicate how the Smith reference overcomes this negative teaching.

As a result of the above, claim 1 and claims 11-15 dependent thereon are clearly non-obvious over the admitted prior art, John and Smith combination and any further rejection thereunder is respectfully traversed.

L. Rejection of claims 16-19 as unpatentable over admitted prior art and John, further in view of Akmal

Claims 16-19 depend from independent claim 1 and therefore the above discussion of the admitted prior art and the John reference set out in subsection I is herein incorporated by reference. It is noted that the Examiner does not allege that the Akmal reference teaches the missing method step from the admitted prior art and the John reference, i.e., pre-assembly curing of sealant materials.

Additionally, the Examiner fails to set out any explicit "analysis" of why he would pick and choose elements or method steps from the admitted prior art and the John and Akmal references and then combine them in the manner of Appellants' claims. Moreover, the Examiner does not appear to recognize that both the admitted prior art and the John reference teach away from the claimed combination of method steps set out in independent claims 1 and 22 and additionally does not indicate how the Akmal reference overcomes this negative teaching.

As a result of the above, claim 1 and claims 16-19 dependent thereon are clearly non-obvious over the admitted prior art, John and Akmal combination and any further rejection thereunder is respectfully traversed.

M. Provisional rejection of claims 22 and 23 on the ground of nonstatutory obviousness-type double patenting

The Examiner's provisional rejection of claims 22 and 23 on the ground of nonstatutory obviousness-type double patenting is very much appreciated but is untimely and should be withdrawn. Appellants' respectfully traverse this basis for rejection of claims 22 and 23 on the ground that the co-pending application has not yet issued as a patent. Thus, the issue is premature because the claims in the copending application may be amended to cover different subject matter by the time any patent is actually issued. Accordingly, it is again requested that the Examiner and the Board suspend this rejection pending issuance of one of the applications and then the claims of the issued patent can be considered with respect to any pending claims in this application.

As a result, the provisional double patenting rejection is traversed as being premature in view of the fact that both applications are still pending.

VIII. CONCLUSION

In view of the above, it is clear that the Examiner has not properly construed the terms "cure" and "cured" in independent claims 1 and 22 giving a conventional dictionary definition to the terms, has ignored the specification clarification of the terms and has also ignored the expert testimony of Dr. Harris on the matter. The Examiner then compounds his error by alleging that the John

reference teaches all aspects of the invention of claims 1 and 22 in spite of the errors noted in the John reference and in the Examiner's analysis thereof by Dr. Harris. The Examiner does not point to any other reference alleged to teach pre-assembly "curing" and therefore cannot support the obviousness rejection of independent claims 1 and 22 or claims dependent thereon. Finally, the Examiner fails to appreciate that the pre-assembly curing product is substantially different from a post-assembly cured product and Dr. Harris' testimony provides evidence of record in this regard as well. Inasmuch as the Examiner has failed to provide any evidence rebutting Dr. Harris' testimony, the Examiner has failed to meet his burden of providing evidence supporting his rejections.

As a result of the above, there is simply no support for the rejections of Applicants' independent claim or claims dependent thereon under 35 USC §102 or §103. Thus, and in view of the above, the rejection of claims 1-23 under 35 USC §§102 and 103 is clearly in error and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____

Stanley C. Spooner
Reg. No. 27,393

SCS:kmm
Enclosure

IX. CLAIMS APPENDIX

1. A method of assembling components together in sealed relationship, the components have respective mating surfaces, the method including the steps of:

applying to at least one mating surface a layer of polysulphide sealant and allowing the sealant to cure;

after allowing said sealant to cure, bringing together the mating surfaces; and

applying a pre-determined pressure therebetween for a pre-determined period whereby to bring about a sealed joint between the two mating surfaces.

2. A method as in claim 1 in which said layer of polysulphide sealant is applied to both mating surfaces.

3. A method as in claim 1 in which the period of application of pressure is at least 1 hour.

4. A method as in claim 3 in which the said period is between 5 and 1×10^7 hours.

5. A method as in claim 3 in which the said period is between 8 and 1440 hours.

6. A method as in claim 1 in which the pre-determined pressure is between 5 and 400 MPa.

7. A method as in claim 1 in which the pre-determined pressure is between 5 and 200 MPa.

8. A method as in claim 1 in which the pre-determined pressure is between 8 and 50 MPa.

9. A method as in claim 1 in which the pre-determined pressure is applied by bolting together the two components in their final assembled configuration.

10. A method as in claim 1 in which the components are subject to a raised temperature during at least part of the step of applying pressure.

11. A method as in claim 1 in which the at least one layer of polysulphide sealant is applied to a painted said mating surface.

12. A method as in claim 11 in which the layer of polysulphide sealant is applied to the painted mating surface a sufficiently short time after the paint is applied to at least substantially reduce the need for any further treatment of the painted surface prior to the application of the layer of polysulphide sealant.

13. A method as in claim 12 in which the layer of polysulphide sealant is applied to the painted surface immediately after the paint has dried.

14. A method as in any preceding claim in which the components with sealant applied are stored, including the step of applying a protective covering to the cured layer of polysulphide sealant prior to storage of the component.

15. A method as in claim 1, in which the mating surface to which the layer of polysulphide sealant is not applied is a painted surface.

16. A method as in claim 1 in which the layer of polysulphide sealant applied is a transition metal oxide curing compound.

17. A method as in claim 1 in which the layer of polysulphide sealant applied is a manganese dioxide curing compound.

18. A method as in claim 1 in which the layer of polysulphide sealant applied is a dichromate curing compound.

19. A method as in claim 1 in which the layer of polysulphide sealant applied is an organic-cure compound.

20. A method of assembling components together as in claim 1 in which the components comprise aircraft structural components.

21. A method as in claim 20 in which the aircraft structural components are used to house fuel on board the aircraft.

22. An assembly of two components for forming a fluid-tight seal together, each component having a mating surface for sealing to a mating surface of the other component, said assembly comprising at least one said mating surface having a layer of polysulphide sealant cured thereon prior to assembly.

23. An assembly as in claim 22 in which the components will form part of a fuel storage system for an aircraft.

X. EVIDENCE APPENDIX

1. Declaration of Dr. Steven Harris Under Rule 132 w/ attached CV

2. Clearer, but unsigned copy of Dr. Harris' Declaration

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

WEST et al. Atty. Ref.: SCS-540-563

Serial No. 10/535,493 TC/A.U.: 1791

Filed: May 18, 2005 Examiner: J. Goff II

For: ASSEMBLY OF SEALED COMPONENTS

* * * * * * * * * * *

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION OF DR. STEVEN HARRIS UNDER RULE 132

I, Steven Harris, hereby declare as follows:

1. That I am a chemist currently employed by BAE Systems – Advanced Technology Center (ATC) at Sowerby, United Kingdom;

2. That my educational and professional experience is listed in the attached CV dated 8 August 2007;

3. That I have been asked to review the above-identified patent application as originally filed, the claims in the October 1, 2007 Amendment and the Official Action mailed on December 12, 2007 by the U.S. Patent and Trademark Office and I have reviewed these three documents;

4. In the Examiner's rejection of independent claim 22 under §102 as being anticipated by John (U.S. Patent 3,022,870), the Examiner contends that "the claimed

product appears to be the same or similar to that of the prior art, although produced by a different process."

5. While the Examiner's initial conclusion is understandable, it is incorrect and does not reflect knowledge of the properties of cured sealant as opposed to uncured sealant or the difference in properties depending upon when curing occurs during the assembly process.

6. Claim 22 requires an assembly of surfaces "having a layer of polysulphide sealant cured thereon prior to assembly." A "cured" layer of polysulphide sealant is a sealant which has reached a Shore A hardness of approximately 39 and which is tack free, will not adhere to other materials, e.g., glass or metal, upon contact or under light pressure, e.g., finger pressure, and which will have good levels of environmental resistance.

7. With respect to claim 22, the Examiner's rejection under 35 USC §102(b) is based upon John disclosing the claims "layer of polysulphide sealant cured thereon prior to assembly" which is simply incorrect.

8. The Examiner also states with respect to the rejection of claim 1 under 35 USC §103 that the John reference teaches "applying a cured polysulphide sealant to at least one of the mating surfaces" in section 5 on page 3 of the Final Rejection and this statement is similarly incorrect.

9. Those of ordinary skill in the art will be well aware of the benefits of the invention claimed in claims 1 and 22 in view of Applicants' specification, i.e., the pre-assembly curing of polysulphide sealant. These benefits of curing the sealant prior to

bringing together the mating surfaces are a significant improvement over known processes and provide a number of unexpected advantages.

10. The benefits of pre-assembly curing of sealant on one of the mating surfaces include a resultant layer of sealant that is thicker and will exist across the faying or mating surfaces. This benefit is because the sealant layer, having already been cured, is not prone to squeeze out near fasteners (which provide the mating pressure), as the sealant is never in the liquid phase when under compression.

11. The pre-assembly curing of sealant also tends to result in less broken sealant between the components in the joint of the invention. The cured sealant bond has a typical strength of 3.5 to 5 MPa and, because of the curing of the sealant prior to assembly of the mating surfaces, the sealant layer will not be in tension but will normally be in compression.

12. During the known and conventional sealant process as disclosed in John, sealant is applied in the liquid phase to one of the mating surfaces which is then brought into contact with the other mating surface and they are fastened together within the working time of the sealant, i.e., prior to its becoming cured. The joint is then left undisturbed until a significant level of cure is attained.

13. The consequence of post-assembly curing is that the resulting layer of sealant will be thin, owing to the mating surfaces being fasted together with the sealant still in the liquid phase being squeezed out from between the surfaces.

14. The post-assembly cured sealant will also be under slight tension due to the inherent shrinkage occurring during curing process.

15. The post-assembly cured sealant will be almost completely absent from area immediately surrounding fasteners (holding the two mating surfaces together) because the fasteners hold the areas tightly against one another, thereby excluding sealant therefrom.

16. With the cured sealant assembly process, there is a thicker layer of sealant in the vicinity of fasteners, there is no metal-to-metal contact (which could otherwise take place with the uncured sealant being squeezed out of the space between the two contact surfaces), especially in the vicinity of the fasteners. The uncured sealant is simply not stable enough to resist squeezing of the sealant out of the joint when the joining pressure is applied. In the present invention, because the sealant is fully cured, it does not squeeze or flow under assembly pressure.

17. Turning now to the error in the Examiner's understanding, i.e., that the John reference teaches sealant curing prior to assembly. Those of ordinary skill in the art in the polysulphide sealant field will be well aware that polysulphide sealants typically cure in around 14 days and this is disclosed in the originally filed specification at page 6, lines 18-20.

18. In the John reference at column 2, lines 63-64, there is a statement that the mixture used cures in about 2 hours to a non-spreadable state. John at column 2, line 71 to column 3, line2, states that the curing is completed within about 12 hours. Based upon these disclosures in John, it would be clear to those of ordinary skill in the art that John's polysulphide sealant is not "cured" either as described in Applicants' specification and claims or as known to those of ordinary skill in the art.

19. Based upon the disclosure of the alleged curing cycles in John, it is clear that the John polysulphide sealant may never achieve more than 50 to 70% cure during the time periods specified. In the time period for polysulphide sealant curing specified in the current specification, i.e., 14 days, the sealant is approximately 99% cured and therefore this is the definition to the word "cure" as used in the specification and the claims. Thus John discloses an un-cured polysulphide sealant in his assembly process.

20. In column 1, line 1 of the John patent, it is stated that "[t]his invention relates to adherent polymeric films or strips . . . ." An "adherent" film or strip sticks to things by electrostatic force. The polysulphide sealant of the present invention is not "adherent." After fully curing, the presently claimed polysulphide sealant does not stick to anything when pressed against it. The cured polysulphide sealant only forms a bond when it is pressed against something for a period of time. Thus John discloses an un-cured polysulphide sealant in his assembly process.

21. Column 1, lines 13-15 of John states "thin self-sustaining films or strips having a polysulphide polymer base which are adherent to clean aluminum surfaces." The present invention's polysulphide sealant does not adhere to clean aluminum surfaces or to any other surface in its fully cured state. Thus John discloses an un-cured polysulphide sealant in his assembly process.

22. Column 1, lines 47-49 of the John reference states "[f]irm plastic films, on the other hand, do not make adequate contact with the faying surfaces and do not provide a fully effective sealer." This passage would lead those of ordinary skill in the art away from the present invention by indicating that films which are apparently similar in

consistency to the sealant of the present invention do not make "adequate contact" with the mating surfaces after curing. Thus John discloses an un-cured polysulphide sealant in his assembly process.

23. Column 1, lines 59-63 of John states that "[i]t [the film] does not adhere to the fingers, nor indeed to most materials on temporary contact, but is found to adhere to clean aluminum as well as many other surfaces when held briefly in contact therewith." As noted above, the cured sealant of the present invention does not do this or have this feature and thus John discloses an un-cured polysulphide sealant in his assembly process..

24. Column 1, lines 68-70 of John states "[i]t adheres to the metal surfaces, forms a continuous sealing layer therebetween and effectively prevents passage of air and liquids." Again, this teaching in the John reference stipulates adherence of the film to the metal, which does not occur with the cured sealant of the present invention. Thus John discloses an un-cured polysulphide sealant in his assembly process.

25. Column 3, lines 5-9 of the John reference states "[t]he film produced as just described is found to be strongly adherent to glass and only slightly less adherent to clean aluminum. It may be removed from one of the protective polyethylene films and adhered to a metal surface under slight finger pressure." This passage in John again leads me to strongly believe that the film used in the John assembly process is nowhere near a fully cured polysulphide sealant.

26. John at column 3, lines 43-45, states "[i]n place of maleic anhydride, other equivalent adhesion-imparting acidic materials such as dichloromaleic anhydride and itaconic anhydride may be used." Again, this is further evidence to me that polysulphide

sealant film in John is not cured before completion of his assembly process and that acidic bonds are being formed with the metal substrate during the post-assembly curing process.

27. Finally, John at column 3, lines 64-67, states [a]n excessive cure, on the other hand, reduces the adhesive properties of the film to a degree which makes it difficult to apply in commercial sealing operations, e.g., in the assembling of an aircraft." This passage clearly teaches away from the current invention because John's "excessive cure" is a reference to a fully cured polysulphide sealant, as would normally be understood by those of ordinary skill in the art. Of course, in the present invention wherein the fully cured sealant layer is tack free and in a condition where adhesion to surfaces cannot take place.

28. Thus, based upon the above, I conclude that the John reference does not teach that the layer of polysulphide sealant is cured "prior to" assembling the mating surfaces, whereas this pre-assembly curing is positively recited both in method claim 1 and in assembly claim 22.

29. The Examiner, in the sentence bridging pages 2 and 3 of the Final Rejection, suggests that where a claimed product "appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior product." Numerous differences between the resultant assembly when accomplished in the manner of the John patent and when accomplished in the manner of claims 1 and 22 have been noted, i.e., (a) the assembled components

utilizing pre-assembly curing in accordance with the presently claimed invention have a thicker sealant layer (whereas in John, the un-cured sealant will be squeezed out from between the faying surfaces); (b) the cured layer extends more uniformly across the mating surfaces; (c) there is also a sealant layer in the area of the fasteners (whereas in the post-assembly cured process of John, the sealant layer will be squeezed out under the fasteners allowing metal-to-metal contact); and (d) as a result of the pre-assembly curing, the sealant layer, after assembly, will normally be in compression (whereas due to shrinkage during curing, the sealant layer in John will be under tension).

30. Because of the above differences between the assembled product having pre-assembly curing of the polysulphide sealant as opposed to post-assembly curing as in John, it is clear that there are significant benefits which were apparently unrecognized by the John patent (and any other prior art references).

31. For the above reasons, the assembled "assembly" of claim 22 is substantially different from any assembly in accordance with the John patent. Furthermore, such differences would be readily obvious to those of ordinary skill in the art in view of the present application.

32. That I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

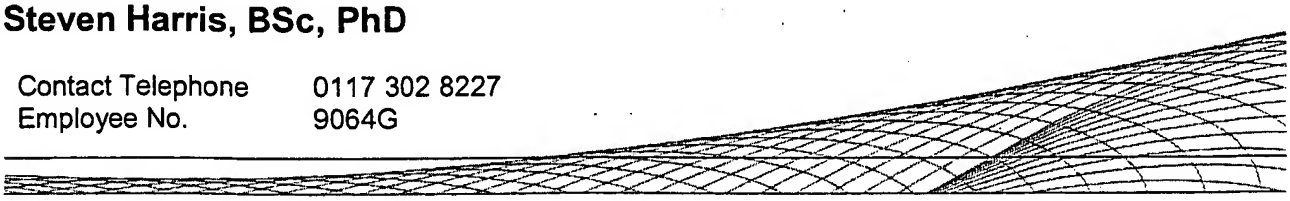
Date: 17/6/08.

Dr. Steven Harris

Attachment:
CV of Steven Harris, BSc, PhD

Steven Harris, BSc, PhD

Contact Telephone 0117 302 8227
Employee No. 9064G



Professional Profile

I am a Chemist, in the aerospace industry that specialises in materials related projects. My key area of expertise is in the analysis of surfaces and the properties of these surfaces. My current responsibilities are more project management related, and I have a successful track record in both project management and technical contributions to projects.

Principal Skills and Experience

Technical Areas:

Paints, Sealants, Corrosion, Conversion Coatings, Diffusion Bonding of Aluminium Alloys, Metal Matrix Composites, Analytical Support, Surface Analysis, Corrosion Sensors, Adhesion, Welding & Composites.

Technical Responsibilities:

Development of the surface analysis suite at ATC-Sowerby; Specifying and subsequently purchasing the following major facilities for the ATC: XPS, AES, SIMS, STM, SEM, EDX, AFM, XRD, VPSEM.
Development of the corrosion sensor technology for aerospace applications, this includes a management and technical role in application of this technology to land, air and sea platforms.
Management of the ATC research on welding, adhesive bonding, coatings, NDT, bio sensors (Stress Measurement), environmental monitoring, platform corrosion and the evaluation of stealth coatings.

Employment History

BAE SYSTEMS Advanced Technology Centre (ATC)

www.baesystems.com

Current Job Title:

Core Title: Group Leader Materials Engineering Research
BAE Systems ECP Manager (Core Engineering Research Programme)
Sales/Marketing Liaison for Materials Department as part of the ATC extended marketing team.

Career Profile:

1988–2007 Materials Sciences Department at the Advanced Technology Centre, Sowerby Building. Listed below is a summary of major internal BAE Systems and collaborative projects I have been involved with since 1989.

Internal Projects:

1989-1990 Corrosion of Metal Matrix Composites (Project Leader)
1990-1996 Diffusion Bonding of Al-Alloys (Project Leader)
1993-1998 Adhesive Bonding Technology (analytical support to the project team)

1997-2001	Paints and Coatings (Project Manager), project now part of Life Cycle Technologies
1997-1999	Sealants (Project Manager)
1997-2000	Advanced metallics (Project Manager)
1999-2001	Modeling Metallic Corrosion (Project Manager)
1998-2007	Multi-Functional Corrosion Sensors (Project Manager), project now part of Life Cycle Technologies (ECP 3000 Platform Technologies)

Collaborative Projects:

1990-1992	***DUWLAP***, EU programme, Analytical support to OLT
1991-1994	***ABHTA***, EU, Analytical support to main programme
1993-1995	***INDAL***, DTI, Analytical support to OLT
1996-1998	***NAWM***, EU, Analytical support to OLT
1997-2000	***NcMAT***, EU, Analytical support to main programme
1997-2001	***MaSSPS***, EU, Project Manager
1998-2001	***ACC***, OFFSET with DSTO/CSIRO, ATC-Project Leader
1998-2002	***CPM***, OFFSET with DSTO/CSIRO, Analytical support to main programme
2002-2005	**Picasso,** Development of sprayable RAM coatings for Air Vehicles

1983 – 1984 Placement year with UKAEA Winfrith in the Light Water Reactor Group

Education

Southampton University

1985-1988 PhD in Surface Science fully sponsored by UKAEA Winfrith. Title of PhD "Application of Surface Science to the Study of the Corrosion of PWR Primary Circuit Materials". Received PhD, August 1989.

University of Portsmouth

1981-1985 BSc in Applied Chemistry (Hons) 1st

Membership of Professional Bodies

Member of the Institute of Corrosion (1992-2003)
Fellow of the Royal Microscopy Society (1992-2001)
SRC/EPSRC Structural Materials Panel (Since 1992)
ISO TC201: Surface Chemical Analysis (Since 1992)
BSI CII 60: Surface Chemical Analysis (Since 1992)
BSI STI/10 Test Methods for paints (Since 2001)
BSI STI/21 Surface preparation of steel (Since 2001)
BSI STI/32 Anodic Oxidation Coatings On Aluminium (Since 2001)
BSI STI/37 Methods of metallic and related coatings, including corrosion tests (Since 2001)
BSI STI/38 Chemical Conversion Coatings (Since 2001)
Secretary of UK ESCA Users Group 1993-2000
Secretary of UK SAF 2000-2006.
Non-executive committee member of UKSAF 2006
NPL Advisory Committee for the Valid Analytical Measurement (VAM) programme (1993)

Achievements

2001- 2006	**Chairman's Awards**
Bronze	Integrated Corrosion Sensing System
Bronze	Condition based maintenance for JSF
Bronze	Making Dumb Munitions Smart

Bronze	Weld Guided Waves – seeing the unknown
Bronze	In-situ Airframe Analysis (TNA)
Bronze	Paint Rejuvenation (Patent)
Bronze	Sprayable RAM
Bronze	Development of Molecular Modeling (DFT) for Aerospace Applications
Silver	Multi-Functional Corrosion Sensors (Patent)
Silver	Corrosion Prediction Model

Co Author of 3 patents, on corrosion sensing and paint surface treatments. I have made technical presentations at >20 international conferences and workshops since 1993, on topics ranging from diffusion bonding of aluminum alloys, to the surface chemistry of aerospace sealants.

University Links

Visiting lecturer at Bristol, Birmingham and Surrey University for a number of post graduate courses on surface analysis, corrosion and adhesion science

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of
WEST et al.
Serial No. 10/535,493
Filed: May 18, 2005

Atty. Ref.: SCS-540-563
TC/A.U.: 1791
Examiner: J. Goff II

For: ASSEMBLY OF SEALED COMPONENTS

* * * * * * * * * * * *

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION OF DR. STEVEN HARRIS UNDER RULE 132

I, Steven Harris, hereby declare as follows:

1. That I am a chemist currently employed by BAE Systems – Advanced Technology Center (ATC) at Sowerby, United Kingdom;

2. That my educational and professional experience is listed in the attached CV dated 8 August 2007;

3. That I have been asked to review the above-identified patent application as originally filed, the claims in the October 1, 2007 Amendment and the Official Action mailed on December 12, 2007 by the U.S. Patent and Trademark Office and I have reviewed these three documents;

4. In the Examiner's rejection of independent claim 22 under §102 as being anticipated by John (U.S. Patent 3,022,870), the Examiner contends that "the claimed

product appears to be the same or similar to that of the prior art, although produced by a different process."

5. While the Examiner's initial conclusion is understandable, it is incorrect and does not reflect knowledge of the properties of cured sealant as opposed to uncured sealant or the difference in properties depending upon when curing occurs during the assembly process.

6. Claim 22 requires an assembly of surfaces "having a layer of polysulphide sealant cured thereon prior to assembly." A "cured" layer of polysulphide sealant is a sealant which has reached a Shore A hardness of approximately 39 and which is tack free, will not adhere to other materials, e.g., glass or metal, upon contact or under light pressure, e.g., finger pressure, and which will have good levels of environmental resistance.

7. With respect to claim 22, the Examiner's rejection under 35 USC §102(b) is based upon John disclosing the claims "layer of polysulphide sealant cured thereon prior to assembly" which is simply incorrect.

8. The Examiner also states with respect to the rejection of claim 1 under 35 USC §103 that the John reference teaches "applying a cured polysulphide sealant to at least one of the mating surfaces" in section 5 on page 3 of the Final Rejection and this statement is similarly incorrect.

9. Those of ordinary skill in the art will be well aware of the benefits of the invention claimed in claims 1 and 22 in view of Applicants' specification, i.e., the pre-assembly curing of polysulphide sealant. These benefits of curing the sealant prior to

bringing together the mating surfaces are a significant improvement over known processes and provide a number of unexpected advantages.

10. The benefits of pre-assembly curing of sealant on one of the mating surfaces include a resultant layer of sealant that is thicker and will exist across the faying or mating surfaces. This benefit is because the sealant layer, having already been cured, is not prone to squeeze out near fasteners (which provide the mating pressure), as the sealant is never in the liquid phase when under compression.

11. The pre-assembly curing of sealant also tends to result in less broken sealant between the components in the joint of the invention. The cured sealant bond has a typical strength of 3.5 to 5 MPa and, because of the curing of the sealant prior to assembly of the mating surfaces, the sealant layer will not be in tension but will normally be in compression.

12. During the known and conventional sealant process as disclosed in John, sealant is applied in the liquid phase to one of the mating surfaces which is then brought into contact with the other mating surface and they are fastened together within the working time of the sealant, i.e., prior to its becoming cured. The joint is then left undisturbed until a significant level of cure is attained.

13. The consequence of post-assembly curing is that the resulting layer of sealant will be thin, owing to the mating surfaces being fasted together with the sealant still in the liquid phase being squeezed out from between the surfaces.

14. The post-assembly cured sealant will also be under slight tension due to the inherent shrinkage occurring during curing process.

15. The post-assembly cured sealant will be almost completely absent from area immediately surrounding fasteners (holding the two mating surfaces together) because the fasteners hold the areas tightly against one another, thereby excluding sealant therefrom.

16. With the cured sealant assembly process, there is a thicker layer of sealant in the vicinity of fasteners, there is no metal-to-metal contact (which could otherwise take place with the uncured sealant being squeezed out of the space between the two contact surfaces), especially in the vicinity of the fasteners. The uncured sealant is simply not stable enough to resist squeezing of the sealant out of the joint when the joining pressure is applied. In the present invention, because the sealant is fully cured, it does not squeeze or flow under assembly pressure.

17. Turning now to the error in the Examiner's understanding, i.e., that the John reference teaches sealant curing prior to assembly. Those of ordinary skill in the art in the polysulphide sealant field will be well aware that polysulphide sealants typically cure in around 14 days and this is disclosed in the originally filed specification at page 6, lines 18-20.

18. In the John reference at column 2, lines 63-64, there is a statement that the mixture used cures in about 2 hours to a non-spreadable state. John at column 2, line 71 to column 3, line2, states that the curing is completed within about 12 hours. Based upon these disclosures in John, it would be clear to those of ordinary skill in the art that John's polysulphide sealant is not "cured" either as described in Applicants' specification and claims or as known to those of ordinary skill in the art.

19. Based upon the disclosure of the alleged curing cycles in John, it is clear that the John polysulphide sealant may never achieve more than 50 to 70% cure during the time periods specified. In the time period for polysulphide sealant curing specified in the current specification, i.e., 14 days, the sealant is approximately 99% cured and therefore this is the definition to the word "cure" as used in the specification and the claims. Thus John discloses an un-cured polysulphide sealant in his assembly process.

20. In column 1, line 1 of the John patent, it is stated that "[t]his invention relates to adherent polymeric films or strips . . . ." An "adherent" film or strip sticks to things by electrostatic force. The polysulphide sealant of the present invention is not "adherent." After fully curing, the presently claimed polysulphide sealant does not stick to anything when pressed against it. The cured polysulphide sealant only forms a bond when it is pressed against something for a period of time. Thus John discloses an un-cured polysulphide sealant in his assembly process.

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22. Column 1, lines 47-49 of the John reference states "[f]irm plastic films, on the other hand, do not make adequate contact with the faying surfaces and do not provide a fully effective sealer." This passage would lead those of ordinary skill in the art away from the present invention by indicating that films which are apparently similar in

consistency to the sealant of the present invention do not make "adequate contact" with the mating surfaces after curing. Thus John discloses an un-cured polysulphide sealant in his assembly process.

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sealant film in John is not cured before completion of his assembly process and that acidic bonds are being formed with the metal substrate during the post-assembly curing process.

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28. Thus, based upon the above, I conclude that the John reference does not teach that the layer of polysulphide sealant is cured "prior to" assembling the mating surfaces, whereas this pre-assembly curing is positively recited both in method claim 1 and in assembly claim 22.

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utilizing pre-assembly curing in accordance with the presently claimed invention have a thicker sealant layer (whereas in John, the un-cured sealant will be squeezed out from between the faying surfaces); (b) the cured layer extends more uniformly across the mating surfaces; (c) there is also a sealant layer in the area of the fasteners (whereas in the post-assembly cured process of John, the sealant layer will be squeezed out under the fasteners allowing metal-to-metal contact); and (d) as a result of the pre-assembly curing, the sealant layer, after assembly, will normally be in compression (whereas due to shrinkage during curing, the sealant layer in John will be under tension).

30. Because of the above differences between the assembled product having pre-assembly curing of the polysulphide sealant as opposed to post-assembly curing as in John, it is clear that there are significant benefits which were apparently unrecognized by the John patent (and any other prior art references).

31. For the above reasons, the assembled "assembly" of claim 22 is substantially different from any assembly in accordance with the John patent. Furthermore, such differences would be readily obvious to those of ordinary skill in the art in view of the present application.

32. That I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: _____ _____
Dr. Steven Harris

Attachment:
CV of Steven Harris, BSc, PhD

XI. RELATED PROCEEDINGS APPENDIX

None.